A symplectic explicit trigonometrically-fitted Runge-Kutta-Nyström method for the numerical solution of periodic problems

ABSTRACT

In this paper, symplectic third-order three-stage explicit trigonometrically-fitted Runge-Kutta-Nyström (RKN) method for the numerical solution of second order initial value problems with periodic solutions is derived. The numerical results show the accuracy of the new method in comparison with other existing symplectic and non-symplectic RKN methods.

Keyword: Runge-Kutta-Nyström (RKN); Numerical solution; Fields of applied sciences